Amendment to the Claims

In the Claims:

Please amend Claims 1, 8, 16, 27, and 29-43, and add new Claim 44 as follows:

1. (Currently Amended) A method for identifying a specific cell, to enable a determination to be made as to whether the specific cell corresponds to a known cell type, wherein the known cell type relates to the viability of the cell, comprising the steps of:

providing spatial frequency content data from a side scatter image of the known cell type;

directing incident light at the specific cell, using a detector to obtain the side scatter image of the specific cell; and

comparing the spatial frequency content of the side scatter image of the specific cell to the spatial frequency content data of the side scatter image of the known cell type to determine if the specific cell corresponds to the known cell type.

2. (Previously Presented) The method of claim 1 wherein there is relative motion between the specific cell and the detector.

3. (Previously Presented) The method of claim 1 wherein the specific cell identified is contained within a heterogeneous cell population, and side scatter image data is collected for the heterogeneous cell population.

4. (Original) The method of claim 1 wherein the specific cell identified is an apoptotic cell.

5. (Original) The method of claim 4 wherein the apoptotic cell is an early stage apoptotic cell or a late stage apoptotic cell.

6. (Original) The method of claim 1 wherein the specific cell identified is a necrotic cell.

7. (Original) The method of claim 1 wherein the specific cell identified is at least one of an apoptotic cell and a necrotic cell.

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8. (Currently Amended) A method for identifying a specific cell, to enable a determination to be made as to whether the specific cell corresponds to a known cell type, wherein the known cell type relates to the viability of the cell, comprising the steps of:

providing spatial frequency content data from a brightfield image of the known cell type;

directing incident light at the specific cell, using a detector to obtain the brightfield image of the specific cell; and

comparing the spatial frequency content of the brightfield image of the specific cell to the spatial frequency content data of the brightfield image of the known cell type to determine if the specific cell corresponds to the known cell type.

9. (Previously Presented) The method of claim 8 wherein there is relative motion between the specific cell and the detector.

10. (Previously Presented) The method of claim 8 wherein the specific cell identified is contained within a heterogeneous cell population, and brightfield image data is collected for the heterogeneous cell population.

11. (Original) The method of claim 8 wherein the specific cell identified is an apoptotic cell.

12. (Original) The method of claim 11 wherein the apoptotic cell is an early stage apoptotic cell or a late stage apoptotic cell.

13. (Original) The method of claim 8 wherein the specific cell identified is a necrotic cell.

14. (Original) The method of claim 8 wherein the specific cell identified is at least one of an apoptotic cell and a necrotic cell.

15. (Original) The method of claim 8 wherein the spatial frequency content is of the nucleus.

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16. (Currently Amended) A method for identifying a specific cell, to enable a determination to be made as to whether the specific cell corresponds to a known cell type, wherein the known cell type relates to the viability of the cell, comprising the steps of:

providing an image of the known cell type that has been marked with a nuclear marker;

providing spatial frequency content data from the image of the known cell type that has been marked with the nuclear marker;

contacting the specific cell with the nuclear marker;

directing incident light at the marked specific cell;

using a detector to obtain an image of the marked specific cell; and

comparing the image of the marked specific cell and a spatial frequency content of the image of the marked specific cell to the marked image of the known cell and the spatial frequency content of the marked image of the known cell type to determine if the specific cell corresponds to the known cell type.

17. (Previously Presented) The method of claim 16 wherein there is relative motion between the specific cell and the detector.

18. (Previously Presented) The method of claim 16 wherein the specific cell identified is contained within a heterogeneous cell population, and image data is collected for the heterogeneous cell population.

19. (Original) The method of claim 16 wherein the specific cell identified is an apoptotic cell.

20. (Original) The method of claim 19 wherein the apoptotic cell is an early stage apoptotic cell or a late stage apoptotic cell.

21. (Original) The method of claim 16 wherein the specific cell identified is a necrotic cell.

22. (Original) The method of claim 16 wherein the specific cell identified is at least one of an apoptotic cell and a necrotic cell.

23. (Original) The method of claim 16 wherein a single nuclear marker is used.

24. (Original) The method of claim 16 wherein the single nuclear marker is 7-aminoactinomycin D.

25. (Cancelled)

26. (Cancelled)

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27. (Currently Amended) A kit for use in a multispectral imaging system to identify a specific cell, comprising a single nuclear marker, wherein a cell is contacted with the single nuclear marker for a time sufficient to allow identification of the cell as an apoptotic cell or a necrotic cell with the multispectral imaging system using only a single nuclear marker.

28. (Original) The kit of claim 27 wherein the single nuclear marker is 7-aminoactinomycin D.

29. (Currently Amended) A method for ~~determining a viability status of~~ identifying a specific cell, to determine a type of the specific cell, comprising the steps of:

exposing the specific cell to a nuclear marker that will bind to DNA in a nucleus of the cell;

~~collecting a darkfield image of the specific cell;~~

~~collecting a brightfield image of the specific cell;~~

collecting ~~a fluorescent~~ spatial frequency image data of the specific cell in which the nuclear marker is present; and

analyzing the ~~fluorescent~~ spatial frequency image data to determine a type of the specific cell, wherein the type of the specific cell is determined by a condition of material in a nucleus of the specific cell, as indicated by the spatial frequency image data ~~wherein the viability status corresponds one of the following:~~

~~a first status indicating that the specific cell is a viable cell;~~

~~a second status indicating that the specific cell is in a relatively early stage of apoptosis;~~

~~a third status indicating that the specific cell is in relatively late stage of apoptosis; and~~

~~a fourth status indicating that the specific cell is a necrotic cell~~.

30. (Currently Amended) The method of claim ~~29~~ 44 wherein the ~~first status~~ viable cell is characterized by a relatively larger cellular area as determined from the brightfield image and no nuclear marker being present in the cell nucleus as determined by the fluorescent image.

31. (Currently Amended) The method of claim ~~29~~ 44 wherein the ~~first status~~ viable cell is characterized by a relatively lower scatter peak intensity as determined from the darkfield image and no nuclear marker being present in the cell nucleus as determined by the fluorescent image.

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32. (Currently Amended) The method of claim ~~29~~ 44 wherein the ~~first status~~ viable cell is characterized by a relatively larger cellular area as determined from the brightfield image, a relatively lower scatter peak intensity as determined from the darkfield image, and no nuclear marker being present in the cell nucleus as determined by the fluorescent image.

33. (Currently Amended) The method of claim ~~29~~ 44 wherein the ~~second status~~ cell in the relatively early stage of apoptosis is characterized by a relatively smaller cellular area as determined from the brightfield image and no nuclear marker being present in the cell nucleus as determined by the fluorescent image.

34. (Currently Amended) The method of claim ~~29~~ 44 wherein the ~~second status~~ cell in the relatively early stage of apoptosis is characterized by a relatively higher scatter peak intensity as determined from the darkfield image and no nuclear marker being present in the cell nucleus as determined by the fluorescent image.

35. (Currently Amended) The method of claim ~~29~~ 44 wherein the ~~second status~~ cell in the relatively early stage of apoptosis is characterized by a relatively smaller cellular area as determined from the brightfield image, a relatively higher scatter peak intensity as determined from the darkfield image, and no nuclear marker being present in the cell nucleus as determined by the fluorescent image.

36. (Currently Amended) The method of claim ~~29~~ 44 wherein the ~~third status~~ cell in the relatively late stage of apoptosis is characterized by a relatively smaller cellular area as determined from the brightfield image and the nuclear marker being present in the cell nucleus as determined by the fluorescent image.

37. (Currently Amended) The method of claim ~~29~~ 44 wherein the ~~third status~~ cell in the relatively late stage of apoptosis is characterized by a relatively higher scatter peak intensity as determined from the darkfield image and the nuclear marker being present in the cell nucleus as determined by the fluorescent image.

38. (Currently Amended) The method of claim ~~29~~ 44 wherein the ~~third status~~ cell in the relatively late stage of apoptosis is characterized by a relatively smaller cellular area as determined from the brightfield image, a relatively higher scatter peak intensity as determined from the darkfield image, and the nuclear marker being present in the cell nucleus as determined by the fluorescent image.

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39. (Currently Amended) The method of claim ~~29~~ 44 wherein the ~~fourth status~~ necrotic cell is characterized by a relatively larger cellular area as determined from the brightfield image and the nuclear marker being present in the cell nucleus as determined by the fluorescent image.

40. (Currently Amended) The method of claim ~~29~~ 44 wherein the ~~fourth status~~ necrotic cell is characterized by a relatively lower scatter peak intensity as determined from the darkfield image and the nuclear marker being present in the cell nucleus as determined by the fluorescent image.

41. (Currently Amended) The method of claim ~~29~~ 44 wherein the ~~fourth status~~ necrotic cell is characterized by a relatively larger cellular area as determined from the brightfield image, a relatively lower scatter peak intensity as determined from the darkfield image, and the nuclear marker being present in the cell nucleus as determined by the fluorescent image.

42. (Currently Amended) The method of claim ~~29~~ 44 wherein the step of analyzing the brightfield image comprises the step of determining if blebbing is present, blebbing being indicative of the ~~second status~~ cell in the relatively early stage of apoptosis and the ~~third status~~ cell in the relatively late stage of apoptosis, while lack of blebbing being indicative of the ~~first status~~ viable cell and ~~fourth status~~ the necrotic cell.

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43. (Currently Amended) The method of claim 42 wherein the step of analyzing the fluorescent image comprises the step of determining if the nuclear marker is present in the cellular nucleus, such that:

when no blebbing is determined to be present by analyzing the brightfield image, and no nuclear marker is determined to be present in the cellular nucleus by analyzing the fluorescent image, it can be concluded ~~that the viability status of the cell corresponds to the first status indicating~~ that the specific cell is the viable cell type;

when blebbing is determined to be present by analyzing the brightfield image, and no nuclear marker is determined to be present in the cellular nucleus by analyzing the fluorescent image, it can be concluded that ~~the viability status of the cell corresponds to the second status indicating that~~ the specific cell is the type of cell in a relatively early stage of apoptosis;

when blebbing is determined to be present by analyzing the brightfield image, and the nuclear marker is determined to be present in the cellular nucleus by analyzing the fluorescent image, it can be concluded that ~~the viability status of the cell corresponds to the third status indicating that~~ the specific cell is the type of cell in a relatively late stage of apoptosis; and

when no blebbing is determined to be present by analyzing the brightfield image, and the nuclear marker is determined to be present in the cellular nucleus by analyzing the fluorescent image, it can be concluded that ~~the viability status of the cell corresponds to the fourth status indicating that~~ the specific cell is of the necrotic type of cell.

44. (New) The method of claim 29, wherein the step of collecting spatial frequency image data comprises the steps of:

collecting a darkfield image of the specific cell;

collecting a brightfield image of the specific cell;

collecting a fluorescent image of the specific cell; and

wherein the step of analyzing comprises the step of determining that the specific cell is one of the following types of cells:

a viable cell;

a cell that is in a relatively early stage of apoptosis;

a cell that is in a relatively late stage of apoptosis; and

a necrotic cell.

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